K to 12 BASIC EDUCATION CURRICULUM
JUNIOR HIGH SCHOOL TECHNOLOGY AND LIVELIHOOD EDUCATION AND SENIOR HIGH SCHOOL TECHNOLOGY AND LIVELIHOOD TRACK
INDUSTRIAL ARTS – RAC SERVICING (DOMRAC) (NC II)

These are the specializations and their pre-requisites. These lists should be used as reference for curriculum maps.

AGRI-FISHERY ARTS

	Specialization	Number of Hours	Pre-requisite
1.	Agricultural Crops Production (NC I)		
2.	Agricultural Crops Production (NC II)++	480 hours	
3.	Agricultural Crops Production (NC III)	640 hours	Agricultural Crops Production (NC II)
4.	Animal Health Care Management (NC III)	320 hours	Animal Production (NC II)
5.	Animal Production (NC II) + *When updated, this CG will become the following:* *1. Animal Production (Poultry-Chicken) (NC II);* *2. Animal Production (Ruminants) (NC II); and* *3. Animal Production (Swine) (NC II)*	480 hours	
6.	Aquaculture (NC II)	640 hours	
7.	Artificial Insemination (Ruminants) (NC II)	160 hours	Animal Production (NC II)
8.	Artificial Insemination (Swine) (NC II)	160 hours	Animal Production (NC II)
9.	Agricultural Crops Production (NC I)	320 hours	
10.	Fish Capture (NC II) ++	640 hours	
11.	Fishing Gear Repair and Maintenance (NC III)	320 hours	
12.	Fish-Products Packaging (NC II)	320 hours	
13.	Fish Wharf Operation (NC I)	160 hours	
14.	Food (Fish) Processing (NC II)	640 hours	
15.	Horticulture (NC II) +	640 hours	
16.	Horticulture (NC III)	640 hours	Horticulture (NC II)
17.	Landscape Installation and Maintenance (NC II)	320 hours	Agricultural Crops Production (NC I)
18.	Organic Agriculture (NC II)	320 hours	Agricultural Crops Production (NC I)
19.	Pest Management (NC II)	320 hours	Agricultural Crops Production (NC I)
20.	Rice Machinery Operation (NC II)	320 hours	Agricultural Crops Production (NC I)
21.	Rubber Processing (NC II)	320 hours	
22.	Rubber Production (NC II)	320 hours	
23.	Slaughtering Operation (NC II)	160 hours	Animal Production (NC II)

+CG to be updated by December 2015
++CG to be uploaded by December 2015

HOME ECONOMICS

	Specialization	Number of Hours	Pre-requisite
1.	Attractions and Theme Parks (NC II)	160 hours	
2.	Barbering (NC II)	320 hours	
3.	Bartending (NC II)	320 hours	
4.	Beauty/Nail Care (NC II)	160 hours	40 hours of the subject during exploratory Grade 7/8
5.	Bread and Pastry Production (NC II)	160 hours	
6.	Caregiving (NC II)	640 hours	40 hours of the subject during exploratory Grade 7/8
7.	Commercial Cooking (NC III)	320 hours	Cookery (NC II)
8.	Cookery (NC II)	320 hours	40 hours of the subject during exploratory Grade 7/8
9.	Dressmaking (NC II)	320 hours	40 hours of the subject during exploratory Grade 7/8
10.	Events Management Services (NC III)	320 hours	
11.	Fashion Design (Apparel) (NC III)	640 hours	Dressmaking (NC II) or Tailoring (NC II)
12.	Food and Beverage Services (NC II) [+]	160 hours	
13.	Front Office Services (NC II)	160 hours	40 hours of the subject during exploratory Grade 7/8
14.	Hairdressing (NC II)	320 hours	
15.	Hairdressing (NC III)	640 hours	Hairdressing (NC II)
16.	Handicraft (Basketry, Macrame) (Non-NC)	160 hours	
17.	Handicraft (Fashion Accessories, Paper Craft) (Non-NC)	160 hours	
18.	Handicraft (Needlecraft) (Non-NC)	160 hours	
19.	Handicraft (Woodcraft, Leathercraft) (Non-NC)	160 hours	
20.	Housekeeping (NC II) [+]	160 hours	
21.	Local Guiding Services (NC II)	160 hours	
22.	Tailoring (NC II)	320 hours	40 hours of the subject during exploratory Grade 7/8
23.	Tourism Promotion Services (NC II)	160 hours	
24.	Travel Services (NC II)	160 hours	
25.	Wellness Massage (NC II)	160 hours	

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INDUSTRIAL ARTS – RAC SERVICING (DOMRAC) (NC II)

INDUSTRIAL ARTS

	Specialization	Number of Hours	Pre-requisite
1.	Automotive Servicing (NC I) [+]	640 hours	
2.	Automotive Servicing (NC II)	640 hours	Automotive Servicing (NC I)
3.	Carpentry (NC II)	640 hours	
4.	Carpentry (NC III)	320 hours	Carpentry (NC II)
5.	Construction Painting (NC II)	160 hours	
6.	Consumer Electronics Servicing (NC II) [+]	640 hours	
7.	Domestic Refrigeration and Airconditioning (DOMRAC) Servicing (NC II)	640 hours	
8.	Driving (NC II)	160 hours	
9.	Electrical Installation and Maintenance (NC II)	640 hours	
10.	Electric Power Distribution Line Construction (NC II)	320 hours	Electrical Installation and Maintenance (NC II)
11.	Electronic Products Assembly and Servicing (NC II) [++] *(CG under construction based on Consumer Electronics Servicing (NC II) CG)*	640 hours	
12.	Furniture Making (Finishing) (NC II) [+]	480 hours	
13.	Instrumentation and Control Servicing (NC II)	320 hours	Electronic Products Assembly and Servicing (EPAS) (NC II)
14.	Gas Metal Arc Welding (GMAW) (NC II)	320 hours	Shielded Metal Arc Welding (SMAW) (NC II)
15.	Gas Tungsten Arc Welding (GTAW) (NC II)	320 hours	Shielded Metal Arc Welding (GMAW) (NC II)
16.	Machining (NC I) [++]	640 hours	
17.	Machining (NC II)	640 hours	Machining (NC I)
18.	Masonry (NC II)	320 hours	
19.	Mechatronics Servicing (NC II)	320 hours	Consumer Electronics Servicing (NC II)
20.	Motorcycle/Small Engine Servicing (NC II)	320 hours	
21.	Plumbing (NC I)	320 hours	
22.	Plumbing (NC II)	320 hours	Plumbing (NC I)
23.	Refrigeration and Air-Conditioning (Packaged Air-Conditioning Unit [PACU]/Commercial Refrigeration Equipment [CRE]) Servicing (NC III)	640 hours	Domestic Refrigeration and Airconditioning (DOMRAC) Servicing (NC II)
24.	Shielded Metal Arc Welding (NC I)	320 hours	
25.	Shielded Metal Arc Welding (NC II)	320 hours	Shielded Metal Arc Welding (NC I)
26.	Tile Setting (NC II)	320 hours	
27.	Transmission Line Installation and Maintenance (NC II)	640 hours	Electrical Installation and Maintenance (NC II)

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[++]CG to be uploaded by December 2015

INFORMATION, COMMUNICATIONS AND TECHNOLOGY (ICT)

	Specialization	Number of Hours	Pre-requisite
1.	Animation (NC II)	320 hours	
2.	Broadband Installation (Fixed Wireless Systems) (NC II)	160 hours	1. Telecom OSP and Subscriber Line Installation (Copper Cable/POTS and DSL) (NC II) 2. Telecom OSP Installation (Fiber Optic Cable) (NC II)
3.	Computer Hardware Servicing (NC II) [+]	320 hours	
4.	Computer Programming (NC IV) [+] *When updated, this CG will become the following:* *1. Programming (.net Technology) (NC II)[++]* *2. Programming (Java) (NC II)[++]* *3. Programming (Oracle Database) (NC II)[++]*	320 hours	
5.	Computer System Servicing (NC II) [++] *(CG under construction based on Computer Hardware Servicing (NC II) CG)*	320 hours	
6.	Contact Center Services (NC II)	320 hours	
7.	Illustration (NC II)	320 hours	
8.	Medical Transcription (NC II)	320 hours	
9.	Technical Drafting (NC II)	320 hours	
10.	Telecom OSP and Subscriber Line Installation (Copper Cable/POTS and DSL) (NC II)	320 hours	Computer Hardware Servicing (NC II)
11.	Telecom OSP Installation (Fiber Optic Cable) (NC II)	160 hours	Telecom OSP and Subscriber Line Installation (Copper Cable/POTS and DSL) (NC II)

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INDUSTRIAL ARTS – RAC SERVICING (DOMRAC) (NC II)
Grade 7/ 8 (Exploratory)

Course Description:
This is an exploratory and introductory course which leads to **RAC Servicing** National Certificate Level II (NC II). It covers **five** common competencies that a **Grade 7/Grade 8** Technology and Livelihood Education (TLE) student ought to possess: (1) using tools, equipment and paraphernalia; (2) performing mensuration and calculation; (3) practicing Occupational Health and Safety (OHS) procedures; (4) maintaining tools, equipment and paraphernalia; and (5) interpreting technical drawing and plans.

The preliminaries of this exploratory course include the following: (1) discussion on the relevance of the course, (2) explanation of key concepts relative to the course, and (3) exploration of career opportunities.

CONTENT	CONTENT STANDARD	PERFORMANCE STANDARD	LEARNING COMPETENCIES	CODE
Introduction 1. Basic concepts in RAC Servicing 2. Relevance of the course 3. Career opportunities	The learner demonstrates an understanding of the basic concepts and underlying theories in RAC servicing.	The learner independently demonstrates common competencies in RAC servicing as prescribed by TESDA Training Regulations..	1. Explain basic concepts in RAC servicing 2. Discuss the relevance of the course 3. Explore on opportunities for RAC servicing as a career	
PERSONAL ENTREPRENEURIAL COMPETENCIES (PeCS)				
1. Assessment of Personal Entrepreneurial Competencies and Skills (PeCS) vis-à-vis a practicing entrepreneur/employee 1.1 Characteristics 1.2 Attributes 1.3 Lifestyle 1.4 Skills 1.5 Traits 2. Analysis of one's PeCS	The learner demonstrates an understanding of one's Personal Entrepreneurial Competencies and Skills (PeCS).	The learner recognizes his/her Personal Entrepreneurial Competencies and Skills (PeCS) and prepares a list of PeCS of a practitioner/entrepreneur in RAC.	**LO 1. Recognize Personal Entrepreneurial Competencies and Skills (PeCS) needed in RAC** 1.1 Assess one's PeCS: characteristics, attributes, lifestyle, skills, traits 1.2 Assess practitioner's: characteristics, attributes, lifestyle, skills, traits 1.3 Compare one's PeCS with that of a practitioner /entrepreneur	**TLE_PECS7/8-00-1**
ENVIRONMENT AND MARKET (EM)				
1. Key concepts of Environment and Market	The learner demonstrates an understanding of the	The learner independently generates a business idea based	**LO 1. Generate a business idea that relates with a career choice in RAC**	**TLE_EM7/8-00-1**

CONTENT	CONTENT STANDARD	PERFORMANCE STANDARD	LEARNING COMPETENCIES	CODE
2. Products & services available in the market 3. Differentiation of products and services 4. Customers and their buying habits 5. Competition in the market 6. SWOT Analysis	concepts environment and market that relates to a career choice in RAC.	on the analysis of environment and market in RAC.	1.1 Conduct SWOT analysis 1.2 Identify the different products/services available in the market 1.3 Compare different products/services in RAC business 1.4 Determine the profile potential customers 1.5 Determine the profile potential competitors 1.6 Generate potential business idea based on the SWOT analysis	
LESSON 1: PREPARE MATERIALS AND TOOLS (UT)				
1. Tools and materials for RAC Servicing	The learner demonstrates an understanding of the concepts in the preparation of RAC materials and tools using the different forms in RAC.	The learner independently prepares appropriate RAC materials and tools using the different forms in RAC based on industry standards.	**LO 1. Prepare RAC materials and tools for the task** 1.1 Prepare a list of electrical tools and materials for a specific job	**TLE_IARA7/8UT -0a-1**
			LO 2. Request appropriate RAC supplies, materials and tools applicable to a specific job 2.1 Use the appropriate form in requesting for electrical tools, supplies and materials for a specific job	**TLE_IARA7/8UT -0a-2**
			LO 3. Receive and inspect RAC supplies, materials and tools 3.1 Check and inspect received items on the list	**TLE_IARA7/8UT -0b-3**

CONTENT	CONTENT STANDARD	PERFORMANCE STANDARD	LEARNING COMPETENCIES	CODE
LESSON 2: PERFORM MENSURATION AND CALCULATION (MC)				
1. Measuring instrument 2. Measurement and calculation 3. Unit Conversion 4. System of measurement 4.1 English 4.2 Metric	The learner demonstrates an understanding of the concepts and underlying principles in performing measurements and calculations.	The learner independently performs accurate measurements and calculation based on given tasks.	**LO 1. Select electrical measuring tools and instruments** 1.1 Identify object or component to be measured 1.2 Choose measuring tools to be used for specific tasks 1.3 Identify alternative measuring tools without sacrificing cost and quality of work	**TLE_IARA7/8MC-0c-1**
			LO 2. Carry out measurements and calculations 2.1. Use appropriate measuring devices for specific tasks 2.2. Compute for required data 2.3. Convert data to its equivalent measure	**TLE_IARA7/8MC0-d-2**
LESSON 3: INTERPRET TECHNICAL DRAWINGS AND PLANS (ID)				
1. Sign, symbols and data 2. Interpret technical drawings and plans 3. Freehand sketching	The learner demonstrates an understanding of the concepts and underlying principles in interpreting simple technical drawings and plans in RAC.	The learner independently reads and interprets specifications of simple technical drawings and plans.	**LO 1. Analyze signs, RAC symbols and data** 1.1 Read and interpret RAC signs, symbols and data 1.2 Analyze RAC components and materials based on electrical signs, symbols and data	**TLE_IARA7/8ID-0e-1**

CONTENT	CONTENT STANDARD	PERFORMANCE STANDARD	LEARNING COMPETENCIES	CODE
			LO 2. Interpret technical drawings and plans 2.1. Read blueprints of RAC plans, diagrams and circuits 2.2. Identify necessary tools, materials and equipment according to blueprints of RAC plans, diagrams and circuits	**TLE_IARA7/8ID-0f-2**
LESSON 4: MAINTAIN TOOLS AND EQUIPMENT (MT)				
1. Checking tools and equipment 2. Maintenance of tools and equipment 2.1 Cleaning 2.2 Lubricating 2.3 Tightening 2.4 Simple tool repair 2.5 Hand sharpening 3. Storing tools and equipment	The learner demonstrates an understanding of the underlying principles in the maintenance of RAC tools and equipment.	The learner independently performs proper maintenance of RAC tools and equipment based on industry standards.	**LO 1. Check condition of tools and equipment** 1.1 Label functional and non-functional tools and equipment	**TLE_IARA7/8MT-0g-1**
			LO 2. Perform basic maintenance 2.1 Perform cleaning and lubricating of tools 2.2 Observe periodic preventive and maintenance of RAC tools and equipment 2.2.1 Sharpening 2.2.2 Oiling 2.2.3 Insulating	**TLE_IARA7/8MT-0h-2**
			LO 3. Store tools and equipments 3.1. Prepare inventory of tools and equipment 3.2. Store tools and equipment in their proper place	**TLE_IARA7/8MT-0h-3**
LESSON 5: PERFORM HOUSEKEEPING AND SAFETY PRACTICES FOR RAC SERVICING (OS)				

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CONTENT	CONTENT STANDARD	PERFORMANCE STANDARD	LEARNING COMPETENCIES	CODE
1. Proper house keeping 2. Hazards in the work area 2.1 Flammable materials 2.2 Running machinery/equipment 2.3 Toxic substances 2.4 Debris 2.5 Open flames 2.6 Loose objects/fixtures 2.7 Chemicals 2.8 Electrical faults 2.9 Hot metals	The learner demonstrates an understanding of the concepts and underlying principles of occupational health and safety procedures.	The learner independently simulates occupational health and safety procedures.	**LO 1. Identify hazards and risks** 1.1 List down hazards and risks in the workplace	**TLE_IARA7/8OS -0i-1**
			LO 2. Control hazards and risks 2.1 Determine effects of hazards and risks 2.2 Evaluate hazards and risks 2.3 Follow procedure for controlling hazards and risks in the workplace	**TLE_IARA7/8OS -0i-2**
			LO 3. Practice OHSP	**TLE_IARA7/8OS -0j-3**

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INDUSTRIAL ARTS – RAC SERVICING (DOMRAC) (NC II)
(160 hours)

Course Description:
This is a specialization course which leads to a **RAC Servicing** National Certificate Level I (NC I). It covers two (1) core competencies that a high school student ought to possess: (1) domestic refrigeration and air-conditioning unit installation, and (2) service and maintainance of window- type air-conditioning / domestic refrigeration units.

The preliminaries of this specialization course include the following: (1) discussion on the relevance of the course, (2) explanation of key concepts relative to the course, and (3) exploration of career opportunities.

CONTENT	CONTENT STANDARD	PERFORMANCE STANDARD	LEARNING COMPETENCIES	CODE
Introduction 1. Basic principles of electricity and mechanical aspects of refrigeration unit 2. Relevance of the course 3. Career opportunities	The learner demonstrates an understanding of the basic principles of electricity and mechanical aspects of refrigeration and air conditioning unit.	The learner independently demonstrates core competencies in RAC servicing as prescribed by TESDA Training Regulations..	1. Explain basic principles of electrical and mechanical aspects of domestic refrigeration unit 2. Discuss the relevance of the course 3. Explore career opportunities in RAC servicing	
PERSONAL ENTREPRENEURIAL COMPETENCIES (PeCS)				
1. Assessment of Personal Competencies and Skills (PeCS) vis-à-vis a practicing entrepreneur/ employee in locality/town. 1.1 Characteristics 1.2 Attributes 1.3 Lifestyle 1.4 Skills 1.5 Traits 2. Analysis of PeCS in relation to a practitioner 3. Align, strengthen and develop ones PeCS based on the results	The learner demonstrates an understanding of one's Personal Competencies and Skills (PeCS) in RAC.	The learner recognizes his/her Personal Entrepreneurial Competencies and Skills (PeCS) and prepares an activity plan that aligns with that of a practitioner/entrepreneur in RAC.	**LO 1. Recognize Personal Entrepreneurial Competencies and Skills (PeCS) needed in RAC** 1.1 Assess one's PeCS: characteristics, attributes, lifestyle, skills, traits 1.2 Assess practitioner's: characteristics, attributes, lifestyle, skills, traits 1.3 Compare one's PECSS with that of a practitioner /entrepreneur 1.4 Align one's PECSS with that of a practitioner/entrepreneur	**TLE_PECS9-12-I0-1**

CONTENT	CONTENT STANDARD	PERFORMANCE STANDARD	LEARNING COMPETENCIES	CODE
ENVIRONMENT AND MARKET (EM)				
Market (Town) 1. Key concepts of Market 2. Players in the Market (Competitors) 3. Products & services available in the market	The learner demonstrates an understanding of the concepts *environment* and *market* in RAC, particularly in one's town/municipality.	The learner independently creates a business vicinity map reflective of the potential RAC market within the locality/town.	**LO 1. Recognize and understand the market in RAC** 1.1 Identify the players/ competitors within the town 1.2 Identify the different products/services available in the market	**TLE_EM9-12-I0-1**
Market (Customer) 4. Key concepts in Identifying and Understanding the Consumer 5. Consumer Analysis through: 1.1 Observation 1.2 Interviews 1.3 Focus group discussion (FGD) 1.4 Survey			**LO 2. Recognize the potential customer/market in RAC** 2.1 Identify profile of potential customers 2.2 Identify the customer's needs and wants through consumer analysis 2.3 Conduct consumer/market analysis	**TLE_EM9-12-II0-2**
6. Generating Business Idea 6.1 Key concepts in Generating Business Ideas 6.2 Knowledge, Skills, Passions and Interests 6.3 New applications 6.4 Irritants 6.5 Striking ideas (new concept) 6.6 Serendipity Walk			**LO 3. Create new business ideas in RAC business by using various techniques** 3.1 Explore ways of generating business idea from ones' own characteristics/attributes 3.2 Generate business ideas using product innovation from irritants, trends and emerging needs 3.3 Generate business ideas using Serendipity Walk	**TLE_EM9-12-III0-IV0-3**

CONTENT	CONTENT STANDARD	PERFORMANCE STANDARD	LEARNING COMPETENCIES	CODE
LESSON 1: INSTALL DOMESTIC REFIRGERATION AND AIR-CONDITIONING UNIT (60 hours) (IR)				
1. Dom RAC Installation Requirements 1.1 Air circulation/ventilation requirements 1.2 Drain disposal requirements 1.3 Power supply requirements 1.4 Structural and architectural requirement 1.5 Provision for serviceability 2. Tools equipment and materials needed in installing DomRAC 3. Survey Inspection Report	The learner demonstrates an understanding of the concepts, underlying theories and principles in installing domestic refrigeration and air-conditioning units.	The learner independently provides quality, competitive and profitable service in installing domestic refrigerator and air-conditioning units.	**LO 1. Conduct survey for unit installation** 1.1 Assess site conditions and installation according to the job requirements 1.2 Determine tools, equipment and materials needed for installation according to site conditions and site installation requirements 1.3 Record result of the survey on site condition and site installation	**TLE_IARA9-12IR-Ia-c-1**
4. Wires and cables used in electrical wiring 5. Classes of outlet/switch boxes used in electrical wiring (PEC) 6. Enclosure and their conditions for use 7. Types of devices used in electrical wiring 8. Identifying wall plugs and masonry bolts 9. Drilling into masonry using portable electrical drill			**LO 2. Install electrical circuit** 2.1 Perform roughing-in activities according to appropriate provision in Philippine Electrical Code (PEC) 2.2 Select electrical cabling and wiring devices of correct load carrying capacity 2.3 Install electrical cabling and wiring devices in line with manufacturer's instructions 2.4 Install power wiring devices in accordance with the PEC 2.5 Test electrical circuit in accordance with PEC	**TLE_IARA9-12IR-Id-IIj-2**

CONTENT	CONTENT STANDARD	PERFORMANCE STANDARD	LEARNING COMPETENCIES	CODE
10. Marking out using spirit level /water level 11. Use of electrical measuring instruments 12. Testing electrical circuits				
13. Refrigeration cycle 14. Aircon/Refrigerator components and accessories 15. Sealant and insulation 16. Fastening device 17. WAC installation procedure 18. Basic plumbing 18.1 Types of PVC drain pipes 18.2 Types of PVC fittings 19. Safety practices			**LO 3. Install window type aircon** 3.1 Prepare unit and equipment/components based on work procedures 3.2 Install bracket, hangers and frames in accordance with manufacturer's recommendation 3.3 Position and level unit in line with manufacturer's instructions 3.4 Install sealing materials to ensure an air tight seal around the unit following manufacturer's instructions 3.5 Install condensate drain according to manufacturer's recommendation 3.6 Employ safe manual handling techniques in line with enterprise OH&S procedures 3.7 Perform proper housekeeping (5S)	**TLE_IARA9-12IR-IIIa-IVj-3**

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(160 hours)

Course Description:
This is a specialization course which leads to a **RAC Servicing** National Certificate Level I (NC I). It covers two (2) core competencies that a high school student ought to possess: (1) domestic refrigeration and air-conditioning unit installation, and (2) service and maintenance of window- type air-conditioning / domestic refrigeration units

The preliminaries of this specialization course include the following: (1) discussion on the relevance of the course, (2) explanation of key concepts relative to the course, and (3) exploration of career opportunities.

CONTENT	CONTENT STANDARD	PERFORMANCE STANDARD	LEARNING COMPETENCIES	CODE
Introduction 1. Basic principles of electricity and mechanical aspects of refrigeration unit 2. Relevance of the course 3. Career opportunities	The learner demonstrates an understanding of the basic principles of electricity and mechanical aspects of refrigeration and air conditioning unit.	The learner independently demonstrates the core competencies in RAC servicing as prescribed by TESDA Training Regulations..	1. Explain basic principles of electrical and mechanical aspects of domestic refrigeration unit 2. Discuss the relevance of the course 3. Explore career opportunities in RAC servicing	
PERSONAL ENTREPRENEURIAL COMPETENCIES (PeCS)				
1. Assessment of Personal Competencies and Skills (PeCS) vis-à-vis a practicing entrepreneur/employee in a province. 1.1 Characteristics 1.2 Attributes 1.3 Lifestyle 1.4 Skills 1.5 Traits 2. Analysis of PeCS in relation to a practitioner 3. Strengthening and further development of one's PeCS	The learner demonstrates an understanding of one's Personal Competencies and Skills (PeCS) in RAC.	The learner independently creates a plan of action that strengthens/ further develops one's PeCS in RAC.	**LO 1. Develop and strengthen personal competencies and skills (PeCS) needed RAC** 1.1 Identify areas for improvement, development and growth 1.2 Align one's PeCS according to his/her business/career choice 1.3 Create a plan of action that ensures success of his/her business/career choice	**TLE_PECS9-12-I0-1**

CONTENT	CONTENT STANDARD	PERFORMANCE STANDARD	LEARNING COMPETENCIES	CODE
ENVIRONMENT AND MARKET (EM)				
1. Product Development 2. Key concepts in developing a product 3. Finding Value 4. Innovation 4.1 Unique Selling 4.2 Proposition (USP)	The learner demonstrates an understanding of the concepts environment and market in RAC, particularly in one's town/municipality.	The learner independently creates a business vicinity map reflective of the potential RAC market within the locality/town.	**LO 1. Develop a product/ service in RAC** 1.1 Identify what is of "Value" to the customer 1.2 Identify the customer 1.3 Explain what makes a product unique and competitive 1.4 Apply creative and innovative techniques to develop a marketable product 1.5 Employ a Unique Selling Proposition (USP) to the product/service	**TLE_EM9-12-I0-II0-1**
1. Selecting a Business Idea 2. Key concepts of Selecting a Business Idea 2.1 Criteria 2.2 Techniques			**LO 2. Select a business idea based on the criteria and techniques set** 2.1. Enumerate various criteria and steps in selecting a business idea 2.2. Apply the criteria/steps in selecting a viable business idea 2.3. Determine a business idea based on the criteria/techniques set	**TLE_EM9-12-III0-2**
7. Branding			**LO 3. Develop a brand for the product** 3.1 Identify the benefits of having a good brand 3.2 Enumerate recognizable brands in the town/province	**TLE_EM9-12-IV0-3**

CONTENT	CONTENT STANDARD	PERFORMANCE STANDARD	LEARNING COMPETENCIES	CODE
			3.3 Enumerate the criteria for developing a brand 3.4 Generate a clear appealing product brand	
INSTALL DOMESTIC REFIRGERATION AND AIR-CONDITIONING UNIT (60 hours) (IR)				
1. Measuring air circulation and velocity 1.1 Velometer 1.2 anemometer 2. Temperature testing 2.1 Thermometer 3. Current and voltage measurement 3.1 Clamp ammeter			**LO 1. Conduct performance test on the installation of window type aircon** 1.1 Check voltage and current according to unit power requirements 1.2 Check air temperature and velocity based on unit specifications 1.3 Inspect sounds and vibration based on unit specifications 1.4 Prepare Installation, testing and commissioning (ITC) report	**TLE_IARA9-12IR-Ia-IIj-4**
SERVICE AND MAINTAIN WINDOW- TYPE AIR-CONDITIONING / DOMESTIC REFRIGERATION UNITS (60 hours) (SR)				
1. Types and classification of air filter used in WAC 2. Effects of restricted air flow in WAC 3. Cleaning and replacing air filters	The learner demonstrates an understanding of the principles in the servicing and maintenance of window type air-conditioning units.	The learner independently performs the servicing and maintenance of window type air-conditions based on the service manual.	**LO 1. Clean and replace air filter** 1.1 Remove air filter from the unit 1.2 Check air filter for damage or replacement 1.3 Clean air filter 1.4 Replace defective air filter in accordance with manufacturer's specification	**TLE_IARA9-12SR-IIIa-j-1**
4. Assembling and disassembling evaporator/condenser in			**LO 2. Service evaporator and condenser** 2.1 Select tools in dismantling the	**TLE_IARA9-12SR-IVa-j-2**

CONTENT	CONTENT STANDARD	PERFORMANCE STANDARD	LEARNING COMPETENCIES	CODE
WAC 5. Cleaning procedure using high pressure washer 6. Straightening of fins 7. Types and application of cleaning agent 8. Effects of heavily dented, corroded coil fins in unit operation 9. Preventive and corrective maintenance of WAC 10. Safety practices 11. Montreal protocol 12. Ozone depletion substances (ODS)			evaporator / condensing unit as per standard operating procedures (SOPs) 2.2 Use high pressure washer in cleaning evaporator/ condensing coil based on standard operating procedure 2.3 Repair defective evaporator/condenser coil fins 2.4 Replace defective evaporator/condenser coil fins in accordance with manufacturer's specification 2.5 Apply cleaning agent or non-corrosive chemical in cleaning and maintaining evaporator/ condensing coil, fins and other body accessories as per standard operating procedures (SOPs)	

K to 12 BASIC EDUCATION CURRICULUM
JUNIOR HIGH SCHOOL TECHNOLOGY AND LIVELIHOOD EDUCATION AND SENIOR HIGH SCHOOL TECHNOLOGY AND LIVELIHOOD TRACK
INDUSTRIAL ARTS – RAC SERVICING (DOMRAC) (NC II)
(160 hours)

Course Description:

This is a specialization course which leads to a **RAC Servicing** National Certificate Level I (NC II). It covers one (1) core competency that a high school student ought to possess—namely, the servicing and maintenance of window- type air-conditioning / domestic refrigeration units. The preliminaries of this specialized course include the following: (1) discussion on the relevance of the course, (2) explanation of key concepts relative to the course, and (3) exploration on career opportunities

CONTENT	CONTENT STANDARD	PERFORMANCE STANDARD	LEARNING COMPETENCIES	CODE
Introduction 1. Basic principles of electricity and mechanical aspects of window type air conditioning unit 2. Relevance of the course 3. Career opportunities	The learner demonstrates an understanding of the basic principles of electricity and mechanical aspects of window type air conditioning units.	The learner independently demonstrates competencies in RAC servicing as prescribed by TESDA Training Regulations.	1. Explain basic principles of electricity and mechanical aspects of window type air-con unit 2. Discuss the relevance of the course 3. Explore career opportunities in RAC servicing	
SERVICE AND MAINTAIN WINDOW- TYPE AIR-CONDITIONING / DOMESTIC REFRIGERATION UNITS (SR)				
1. Assembling and disassembling fan motor assembly in WAC 2. Proper servicing and maintenance procedures in fan motor assembly 2.1 Proper alignment and endplays of fan motor 2.2 Bearing and shafting 2.3 Fan motor parts and assembly 3. Types of lubricant 4. Work Safety	The learner demonstrates an understanding of the principles in servicing window type air-conditioning units.	The learner independently services a window type air condition based on service manual.	**LO 1. MAINTAIN FAN MOTOR ASSEMBLY** 1.1 Clean blower of fan motor based on the manual 1.1.1. Lubricate fan motor 1.1.2. Clean fan blade 1.1.3. Replace defective fan blade 1.1.4. Check fan motor terminals 1.1.5. Replace defective fan motor terminals 1.1.6. Check fan motor mounting 1.1.7. Replace defective fan motor mounting	**TLE_IARAC9-12SR-Ia-j-1**

CONTENT	CONTENT STANDARD	PERFORMANCE STANDARD	LEARNING COMPETENCIES	CODE
4. Electrical/electric controls 5. Electrical symbols and schematic diagrams 6. Proper servicing and maintenance procedures in electrical power and control circuits 6.1 Diagnosing electrical controls 6.2 Determining terminals of electrical controls 6.3 Grounding 6.4 Electrical Safety / Hazards 7. Work safety			**LO 2. SERVICE ELECTRICAL POWER AND CONTROL CIRCUIT** 4.1 Check power supply and electrical control 4.2 Replace defective power supply and electrical control 4.3 Inspect controls and wirings 4.4 Diagnose connections and wirings 4.5 Repair loose connections / wirings 4.6 Check grounding line 4.7 Tighten loose grounding line	**TLE_IARAC9-12SR-IIa-j-2**
8. Fundamentals of refrigeration cycle 8.1 Tracing of refrigeration circuit 9. Refrigerant system components and accessories 10. Operating parameters of refrigerant system 11. Diagnosing refrigerant circuit 12. Reprocessing of refrigeration system 12.1 Replacing defective components 12.2 Repairing refrigerant leak 12.3 Performing pressure leak test 12.4 Performing			**LO 3. MAINTAIN REFRIGERATION SYSTEM** 5.1 Inspect path of the refrigerant circuit for leaks, dents and clogs 5.2 Replace/repair defective parts of the refrigerant circuit 5.3 Inspect refrigerant accessories for leaks and clogs 5.4 Replace refrigerant accessories 5.5 Inspect temperature, pressure, air velocity, and current according to standard operating procedure 5.6 Prepare inspection report 5.7 Repair unit based on inspection report when necessary	**TLE_IARAC9-12SR-IIIa-IVj-3**

CONTENT	CONTENT STANDARD	PERFORMANCE STANDARD	LEARNING COMPETENCIES	CODE
dehydration/vacuum procedures 12.5 Performing refrigerant charging 13. Types of refrigerants 14. Types of refrigerant oil 15. Safe handling of alternative refrigerants 16. Safety in handling nitrogen 17. Montreal protocol 18. Ozone depletion substances (ODS)				

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JUNIOR HIGH SCHOOL TECHNOLOGY AND LIVELIHOOD EDUCATION AND SENIOR HIGH SCHOOL TECHNOLOGY AND LIVELIHOOD TRACK
INDUSTRIAL ARTS – RAC SERVICING (DOMRAC) (NC II)
(160 hours)

Course Description:

This is a specialization course which leads to a **RAC Servicing** National Certificate Level I (NC II). It covers one (1) core competency that a high school student ought to possess—namely, troubleshooting and repairing domestic refrigeration and air-conditioning systems. The preliminaries of this specialized course include the following: (1) discussion on the relevance of the course, (2) explanation of key concepts relative to the course, and (3) exploration on career opportunities.

CONTENT	CONTENT STANDARD	PERFORMANCE STANDARD	LEARNING COMPETENCIES	CODE
Introduction 1. Basic principles of electricity and mechanical aspects of window type air conditioning unit 2. Relevance of the course 3. Career opportunities	The learner demonstrates an understanding of the basic principles of electricity and mechanical aspects of window type air conditioning unit.	The learner independently demonstrates competencies in RAC servicing as prescribed by TESDA Training Regulations.	1. Explain basic principles of electricity and mechanical aspects of window type air-con unit 2. Discuss the relevance of the course 3. Explore on opportunities for RAC servicing as a career	
TROUBLESHOOT AND REPAIR DOMESTIC REFRIGERATION AND AIR-CONDITIOINING SYSTEM (DR)				
1. Electrical plans, symbols and abbreviations 2. Interpreting diagram and details (schematic diagram) 3. Parts of refrigerant circuit 4. Manufacturer's nameplate ratings 5. Electrical /mechanical system analysis 6. Troubleshooting chart, guide and table 7. Diagnostic procedures in troubleshooting	The learner demonstrates an understanding of the concepts, underlying theories and principles in trouble shooting domestic refrigeration and air conditioning systems.	The learner independently performs precise troubleshooting of domestic refrigeration and air-conditioning systems.	**LO 1. PLAN AND PREPARE FOR TROUBLESHOOTING AND REPAIR** 1.1 Prepare tools, equipment and materials needed in trouble shooting and repair 1.2 Familiarize oneself with diagnostic procedures as stated in the service manual 1.3 Analyze wiring diagrams based on charts and manufacturer's manuals	**TLE_IARAC9-12DR-Ia-IIj-1**

CONTENT	CONTENT STANDARD	PERFORMANCE STANDARD	LEARNING COMPETENCIES	CODE
8. Fundamentals of refrigeration and air-conditioning 9. Electrical system analysis 10. Electrical parts, components, functions and operations 11. Testing electrical component procedures 12. Troubleshooting electrical system procedures 13. Repair /replace electrical system procedures 14. Mechanical system analysis 15. Mechanical parts, components, functions and operation 16. Mechanical troubleshooting and repair procedures 17. Electrical/Mechanical operating procedures 18. RAC Code of practice			**LO 2. REPAIR FAULTS/TROUBLES** 2.1 Test components following manufacturer's manual, RAC Code of Practice and/or enterprise troubleshooting policy 2.2 Diagnose components for faults in line with manufacturer's manual, RAC Code of Practice and/or enterprise troubleshooting policy 2.3 Apply appropriate remedial action 2.4 Use appropriate PPE 2.5 Practice safety precautions	**TLE_IARAC9-12DR-IIIa-j-2**
19. Recovery/recycling procedures 20. Refrigerant cylinder calculation 21. Safety in handling refrigerants 22. Maintenance of recovery/recycling equipment /instruments			**LO 3. Perform refrigerant recovery / recycling and retrofitting/ conversion on domestic refrigeration and air-conditioning unit** 3.1 Prepare tools, materials, equipment and instruments for recovery /recycling operation 3.2 Explain the operational procedure of	**TLE_IARAC9-12DR -IVa-j-3**

CONTENT	CONTENT STANDARD	PERFORMANCE STANDARD	LEARNING COMPETENCIES	CODE
23. Alternatives refrigerant and lubricants, types, uses and selection 24. Retrofitting process 25. Safety precaution in retrofitting 26. Proper housekeeping			recovery/recycling 3.3 Perform the operation of recovery/recycling according to manufacturer specifications. 3.4 Apply safety measures in recovery/recycling of refrigerants. 3.5 Use alternative refrigerants and lubricants. 3.6 Use system components and accessories according to application. 3.7 Perform retrofitting in accordance with manufacturer's recommendation 3.8 Observe safety measures in retrofitting. 3.9 Observe proper housekeeping.	
27. Accomplished Worksheet 28. Measuring air circulation and velocity 28.1 Velometer/ anemometer 29. Temperature testing 29.1Thermometer 30. Current and voltage measurement 30.1 Clamp ammeter 31. Unit Operating Procedures 32. Pressure and Temperature Relationship			**LO 4. TEST-RUN REPAIRED UNIT** 4.1 Test unit in line with troubleshooting procedures 4.2 Prepare report on repair and testing of unit conducted	**TLE_IARAC9-12DR -IVa-j-4**

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JUNIOR HIGH SCHOOL TECHNOLOGY AND LIVELIHOOD EDUCATION AND SENIOR HIGH SCHOOL TECHNOLOGY AND LIVELIHOOD TRACK
INDUSTRIAL ARTS – RAC SERVICING (DOMRAC) (NC II)
Code Book Legend

Sample: TLE_IARA9-12SR-IIIa-j-1

LEGEND		SAMPLE	
First Entry	Learning Area and Strand/ Subject or Specialization	Technology and Livelihood Education_Industrial Arts RAC Servicing	**TLE_IARA 9-12**
	Grade Level	Grade 9/10/11/12	
Uppercase Letter/s	Domain/Content/ Component/ Topic	Service and Maintain Window-Type Air-Conditioning/ Domestic Refrigeration Units	**SR**
			-
Roman Numeral **Zero if no specific quarter*	Quarter	Third Quarter	**III**
Lowercase Letter/s **Put a hyphen (-) in between letters to indicate more than a specific week*	Week	Week One to Ten	**a-j**
			-
Arabic Number	Competency	Clean and Replace Air Filter	**1**

DOMAIN/ COMPONENT	CODE
Personal Entrepreneurial Competencies	PECS
Environment and Marketing	EM
Prepare Materials and Tools	UT
Perform Mensuration and Calculation	MC
Interpret Technical Drawings and Plans	ID
Maintain Tools and Equipment	MT
Perform Housekeeping and Safety Practices for RAC Servicing	OS
Install Domestic Refrigeration and Air-Conditioning Units	IR
Service and Maintain Window-Type Air-Conditioning/ Domestic Refrigeration Units	SR

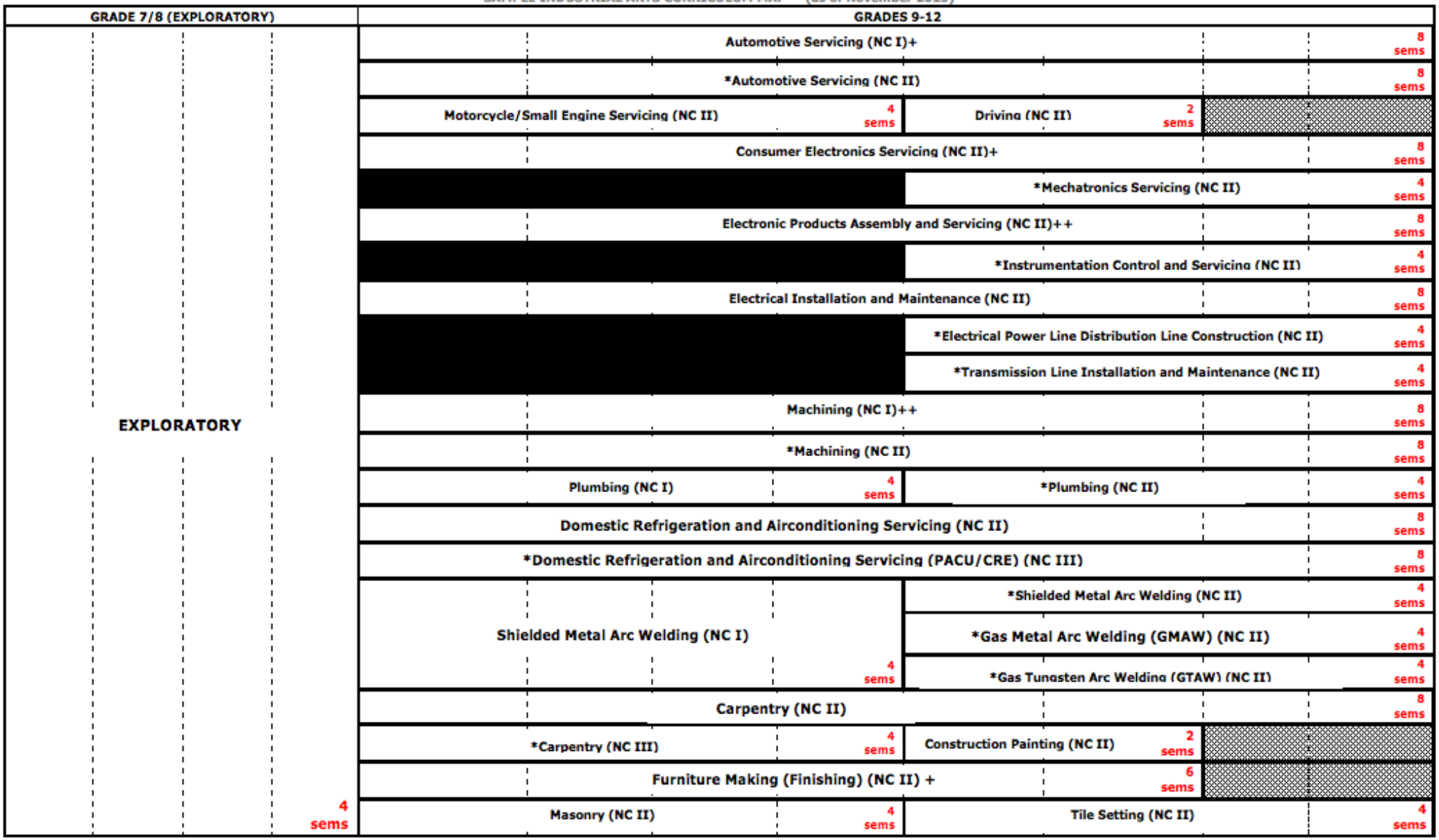
Technology-Livelihood Education and Technical-Vocational Track specializations may be taken between Grades 9 to 12.

Schools may offer specializations from the four strands as long as the minimum number of hours for each specialization is met.

Please refer to the sample Curriculum Map on the next page for the number of semesters per Industrial Arts specialization and those that have pre-requisites. Curriculum Maps may be modified according to specializations offered by a school.

K to 12 BASIC EDUCATION CURRICULUM
JUNIOR HIGH SCHOOL TECHNOLOGY AND LIVELIHOOD EDUCATION AND SENIOR HIGH SCHOOL TECHNOLOGY AND LIVELIHOOD TRACK
INDUSTRIAL ARTS – RAC SERVICING (DOMRAC) (NC II)

SAMPLE INDUSTRIAL ARTS CURRICULUM MAP** (as of November 2015)


GRADE 7/8 (EXPLORATORY)
GRADES 9-12
EXPLORATORY
4 sems
Automotive Servicing (NC I)+ 8 sems
*Automotive Servicing (NC II) 8 sems
Motorcycle/Small Engine Servicing (NC II) 4 sems
Driving (NC II) 2 sems
Consumer Electronics Servicing (NC II)+ 8 sems
*Mechatronics Servicing (NC II) 4 sems
Electronic Products Assembly and Servicing (NC II)++ 8 sems
*Instrumentation Control and Servicing (NC II) 4 sems
Electrical Installation and Maintenance (NC II) 8 sems
*Electrical Power Line Distribution Line Construction (NC II) 4 sems
*Transmission Line Installation and Maintenance (NC II) 4 sems
Machining (NC I)++ 8 sems
*Machining (NC II) 8 sems
Plumbing (NC I) 4 sems
*Plumbing (NC II) 4 sems
Domestic Refrigeration and Airconditioning Servicing (NC II) 8 sems
*Domestic Refrigeration and Airconditioning Servicing (PACU/CRE) (NC III) 8 sems
Shielded Metal Arc Welding (NC I) 4 sems
*Shielded Metal Arc Welding (NC II) 4 sems
*Gas Metal Arc Welding (GMAW) (NC II) 4 sems
*Gas Tungsten Arc Welding (GTAW) (NC II) 4 sems
Carpentry (NC II) 8 sems
*Carpentry (NC III) 4 sems
Construction Painting (NC II) 2 sems
Furniture Making (Finishing) (NC II) + 6 sems
Masonry (NC II) 4 sems
Tile Setting (NC II) 4 sems

* Please note that these subjects have pre-requisites mentioned in the CG.
Other specializations with no pre-requisites may be taken up during these semesters.
Pre-requisites of the subjects to the right should be taken up during these semesters.

\+ CG to be updated by December 2015

++ CG to be uploaded by December 2015

****This is just a sample. Schools make their own curriculum maps considering the specializations to be offered. Subjects may be taken up at any point during Grades 9-12.**